Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

What is Claimed:

1. (Currently Amended) A method of separating ~~a first sample comprising~~ nucleic acids, the method comprising:

providing a matrix that is essentially free of denaturing agents, wherein the matrix has at least one random, linear copolymer comprising acrylamide and N, N-dimethylacrylamide;

~~raising a temperature of~~ thermostatting a first portion of the matrix to at least about 80 °C; and

subjecting the nucleic acids to electrophoresis through ~~at least~~ the first portion of the matrix ~~while the temperature of the first portion is~~ that is thermostatted to at least about 80 °C, [[; and]]

~~deliberately cooling a second portion of the matrix to less than about 30 °C, the nucleic acids migrating through the second portion after they have first migrated through the first portion.~~

2. (Currently Amended) The method of claim 1, wherein the first portion of the matrix is ~~raised~~ thermostatted to a temperature between about 80 °C [[-]] to about 90 °C.

3. Cancelled

4. (Currently Amended) The method of claim 1, ~~wherein the~~ further comprising a second portion of the matrix, wherein the second portion of the matrix is ~~cooled~~ thermostatted to less than about [[25]] 30 °C, and wherein the nucleic acids migrate through the second portion after they have first migrated through the first portion.

5. (Original) The method of claim 1, wherein the matrix is completely free of denaturing agents.

6. (Previously presented) The method of claim 1, further comprising subjecting a second sample of nucleic acids to electrophoresis within the same matrix, after the first sample has been electrophoresed.

7. (Original) The method of claim 6, comprising subjecting a total of at least 25 additional samples of nucleic acids, one at a time, without replacing the matrix.

8.-11. Cancelled

12. (Currently Amended) The method of claim [[11]] 1, wherein the polymer is a copolymer polymerized using about a 1:1 ratio of acrylamide and N, N-dimethylacrylamide monomer.

13. (Currently Amended) A method of sequencing a sample comprising nucleic acids, comprising:

providing a matrix that is essentially free of denaturing agents, the matrix having at least one random, linear copolymer comprising about a 1:1 ratio of acrylamide and N, N-dimethylacrylamide monomer, and a buffer having a pH of at least about 8, a temperature of at least a portion of the matrix being at least about 80 °C ;

subjecting the nucleic acids to electrophoresis through said matrix; and

prior to detecting the nucleic acids, ~~deliberately cooling~~ thermostatting a second portion of the matrix to less than about 25 °C, the second portion of the matrix receiving nucleic acids from the heated portion of the matrix.

14. (Currently Amended) A method of separating a plurality of samples of biological compounds, comprising:

providing a matrix that is essentially free of denaturing agents, wherein the matrix has at least one random, linear copolymer comprising acrylamide and N, N-dimethylacrylamide;and

subjecting a ~~first~~ sample to electrophoresis through said matrix, ~~the first sample comprising nucleic acids, and~~ wherein ~~a temperature of a~~ first portion of the matrix is ~~sufficient to substantially denature the nucleic acids~~ thermostatted to a temperature of at least about 80 °C; and

subjecting a ~~second~~ sequence of samples to electrophoresis in [[a]] separate steps ~~but~~ through the same matrix[[,]]. ~~the second sample comprising a complex of at least two biological compounds.~~

15. (Original) The method of claim 14, wherein the temperature is from about 80 °C to about 99 °C.

16. (Original) The method of claim 15, wherein the temperature is from about 80 °C to about 90 °C.

17. (Currently Amended) The method of claim 15, further comprising

~~deliberately cooling~~ thermostatting a second portion of the matrix to less than about 30 °C, the first and second samples migrating through the second portion after each has first migrated through the first portion.

18. (Currently Amended) The method of claim 17, wherein the second portion of the matrix is ~~cooled~~ thermostatted to less than about 25 °C.

19. (Currently Amended) The method of claim [[15]] 14, wherein the ~~complex~~ sample comprises at least one of nucleic acid, [[a]] nucleic acid-protein complex and [[a]] protein-protein complex.

20.-22. Cancelled

23. (New) The method of claim 1, further comprising:

providing a detection portion of the matrix, wherein nucleic acids migrating from the first portion of the matrix are detected.

24. (New) The method of claim 13, further comprising:

providing a detection portion of the matrix, wherein nucleic acids migrating from the second portion of the matrix are detected.

25. (New) The method of claim 14, further comprising:

providing a detection portion of the matrix, wherein samples migrating from the second portion of the matrix are detected.

26. (New) The method of claim 14, wherein the sequence of samples is at least about 25 samples.

27. (New) The method of claim 14, wherein the polymer is a copolymer polymerized using about a 1:1 ratio of acrylamide and N, N-dimethylacrylamide monomer.